



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
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EPA Region 5 Records Ctr.



290423

REPLY TO THE ATTENTION OF:

SE-5J

FEB 14 2007

MEMORANDUM

DATE: FEB 14 2007

SUBJECT: ENFORCEMENT ACTION MEMORANDUM: Determination of an Imminent and Substantial Threat to Public Health and the Environment at the Plainwell Impoundment Area of the Allied Paper/Portage Creek/Kalamazoo River Superfund Site, Allegan County, Michigan (Site ID# 059B)

FROM: Samuel Borries, On-Scene Coordinator
Emergency Response Branch 2 - Section 2

THRU: Linda M. Nachowicz, Chief *Linda Nachowicz* FJR L.N.
Emergency Response Branch 2

TO: Richard C. Karl, Director
Superfund Division

I. PURPOSE

The purpose of this Action Memorandum is to document the determination of an imminent and substantial threat to public health and the environment at the "Plainwell Impoundment," an area of contamination within the Kalamazoo River Operable Unit of the Allied Paper/Portage Creek/Kalamazoo River Superfund Site (sometimes referred to as the "Site" or the "Kalamazoo River Site"). The Site, which is located in Allegan and Kalamazoo Counties, Michigan, is pervasively contaminated with polychlorinated biphenyl (PCB), primarily as the result of waste practices associated with the de-inking of carbonless copy paper. The Site was listed on the NPL on August 30, 1990.

The Plainwell Impoundment is located in Gun Plain and Otsego Townships, downstream of Plainwell, Michigan, at latitude -85.66835 and longitude 42.45543. As described at greater length below, the Plainwell Impoundment extends 8000 feet upstream from the Plainwell Dam,

and includes 1.5 miles of Kalamazoo River **channel**, adjacent banks, and 79 acres of floodplains.* The Plainwell Dam impounds 77,000 cubic yards of submerged sediment.

The response actions proposed in this Action Memorandum will mitigate threats to public health, welfare, and the environment presented by the presence of an uncontrolled release of PCB, a hazardous substance, into the food chain of the Kalamazoo River from in-stream sediments, riverbank soils, and floodplain soils located within the Plainwell Impoundment. Due to the contaminated nature of the sediment, the continuing release of contamination into the food chain, and potential exposure to the public, this removal action will be classified as time-critical. The proposed response actions include dredging and/or excavation of sediment, riverbank soils and floodplain soil, containment, monitoring, water treatment, stabilization and on-Site disposal. The response activities will require approximately 400 on-Site working days to complete, and will result in the removal of 132,000 cubic yards of waste material, containing 4,400 pounds (88%) of PCB, from the Plainwell Impoundment.

Subsequent to completion of the removal action, Region 5 will complete its evaluation, through the Superfund remedial process, of the risks to human health and the environment presented by the presence of PCB within the first reach of the Kalamazoo River Operable Unit of the Site (which includes the Plainwell Impoundment). This evaluation will consider data collected and analyses performed as part of the removal action described in this Action Memorandum. U.S. EPA will then issue a Record of Decision (ROD) for the entire first reach of the Kalamazoo River Operable Unit (*i.e.* Morrow Dam to the Plainwell Dam) and, as part of that ROD, will determine whether additional response actions are necessary within the Plainwell Impoundment to address risks to human health and the environment not addressed through the time-critical removal process.

Two of the potentially responsible parties (PRPs) for the Site, Millennium Holdings, LLC (MHLLC) and Georgia-Pacific Corporation (GP), are prepared to conduct the time-critical removal action described in this Action Memorandum. Both of these companies are owners of now-inoperable papermaking facilities at the Site. The companies (or their predecessors-in-interest) engaged in the de-inking of carbonless copy paper, and discharged wastes containing high concentrations of PCB into the Kalamazoo River upstream of the Plainwell Impoundment.

The decision by MHLLC and GP to conduct this response action is the result of more than two years of formal mediation among the two companies, U.S. EPA, the Michigan Department of Environmental Quality (MDEQ), the Michigan Department of Natural Resources (MDNR), the Michigan Department of Attorney General, the U.S. Department of Interior and the National Oceanic and Atmospheric Administration. The United States Department of Justice participated in many of the mediation sessions. On August 28, 2006, MHLLC, GP, U.S. EPA, MDNR, MDEQ, and the Michigan Department of Attorney General entered into an Agreement in

* As a general matter, volume, area and distance quantities used in this Action Memorandum are approximations, and represent U.S. EPA's best estimates as of the date of this Action Memorandum.

Principle, pursuant to which MHLLC and GP agreed to conduct a time-critical removal action to excavate and/or dredge PCB from the Plainwell Impoundment. MHLLC and GP also agreed to conduct a Supplemental Remedial Investigation and Feasibility Study (SRI/FS) for the Site. Negotiations for both administrative settlements are almost complete.

The State of Michigan will be a signatory to the Administrative Settlement and Consent Agreement for the proposed time-critical removal action (AOC), which will include, as an enforceable exhibit, an engineering design (Design). MHLLC and GP submitted a draft Design on November 13, 2006. All mediation parties consulted on the draft Design, which was approved by the State of Michigan on February 13, 2007. U.S. EPA expects to approve the Design on February 14, 2007.

II. SITE CONDITIONS AND BACKGROUND

CERCLIS ID # MID006007306

A. Physical Location and Description

The Kalamazoo River Site includes approximately 80 miles of the Kalamazoo River between Morrow Dam and Lake Michigan, adjacent floodplains and wetlands, and (to the extent they contribute PCB to the Kalamazoo River system) four paper waste disposal areas and several former paper mill properties. The Site lies within the Great Lakes Basin in the Kalamazoo River watershed of Michigan's Lower Peninsula. The watershed drains 2,020 square miles of southwest Michigan. It reaches 162 miles into south-central Michigan, and ranges in width from 11 to 29 miles.

The main channel of the Kalamazoo River flows northwest for 123 miles before ultimately emptying into Lake Michigan near Saugatuk, Michigan (KRW PAC 1998; BBL 2000b). The river contributes 42 pounds of PCB annually to Lake Michigan.

Site topography is influenced largely by past glacial activity. The area is relatively flat with gentle rolling plains. In general, the land surface slopes gently westward toward Lake Michigan. Ground and terminal moraines, eskers, and drumlins provide the only significant relief over the region. Low elevation areas are typically wetlands or bodies of open water, such as kettle lakes. Drainage patterns center around the former meltwater drainageway, which is now, at its lowest points, occupied by the Kalamazoo River. The river itself drops 540 feet in elevation from its headwaters to its mouth, producing a slow to moderate stream gradient (KRW PAC 1998).

The Plainwell Dam was built in 1902 as a hydroelectric facility. In 1966, Consumers Power decommissioned the Plainwell Dam as a power generator, and donated it (along with the Otsego and Trowbridge dams) to the Lands Division of MDNR. During the 1970s and 1980s, MDNR dismantled the powerhouse structure and some of the spillway about the fixed crest. As a result, the water level at the Plainwell Impoundment dropped, and formerly-submerged sediments became exposed and ultimately vegetated. These formerly-submerged sediments are now generally referred to as "floodplain soils."

The term "Plainwell Impoundment" or "Plainwell Impoundment area" generally refers to that portion of the Kalamazoo River system that was underwater when the Plainwell Dam was intact and fully operational. At that time, the dam had a head of 13 feet and impounded water to an elevation of 712 feet National Geodetic Vertical Datum (NGVD) (Evans, 1966). The impounded water covered an area of 123 acres (Miller 1966). The sill of the dam now has a head of only 5 feet (Johnson et al. 1989), and an impounded surface area of 44 acres. Within the Plainwell Impoundment, the Kalamazoo River currently averages 197 feet in width and 3.7 feet in depth (BBL 1994c). The drainage area around the impoundment covers 1,299 square miles (Hayes 1996b).

According to MDNR, impoundment stages higher than an elevation of 707.0 feet above mean sea level will result in water flowing over parts of the embankment adjacent to the spillway of the former powerhouse. Spillway capacity at an elevation of 707 feet is about 5,700 cubic feet per second (cfs), which approximates the 10-year flood stage (Hayes 1996b).

The topography of the Plainwell Impoundment area is very much a reflection of the bathymetry of the river before removal of the dam's superstructures. The river has two large meander bends that run about a mile upstream of the reduced dam. The insides of the meander bends are wide and flat, with only 1 to 3 feet of relief. These areas mark the primary location of sediment deposition when the river was fully impounded. The outer banks of the meander bends are steep, with 10 to 25 feet of relief. In some areas of the outer banks, there are small, flat areas 10 to 50 feet wide. These areas, too, are depositional relics of the former impoundment water levels, and have the greatest potential for erosion since they border the eroding bank of the river channel. Upstream of the meander bends, the river straightens its channel somewhat and has wide, impoundment-deposited flats on each side of the river. In areas where the depositional flats are not present, the banks are steep, with 10 to 15 feet of relief.

B. Environmental Justice Analysis

To meet Region 5's Environmental Justice (EJ) concern criteria, the area within 1 mile of a site must have a population that is at least twice the state's average low-income percentage and/or twice the state minority percentage. Among all Michigan residents, the low-income percentage is 29% and the minority percentage is 21%. U.S. EPA's EJ analysis of the population within one mile of the Plainwell Impoundment area determined that the low-income percentage is 30% and the minority percentage is 4%. Therefore, the Plainwell Impoundment area does not meet the Region's EJ criteria based on demographics, as identified in "Region 5 Interim Guidelines for Identifying and Addressing a Potential EJ Case, June 1998."

C. Site Assessments

The Administrative Record for the Kalamazoo River Site contains numerous reports which summarize the investigations conducted to date. Attachment 3 to this Action Memorandum

contains short descriptions of many of the major reports for the Site. Detailed information from the reports most relevant to this time-critical removal action is set forth here:

1. RI/FS Data.

Between 1990 and 2000, several PRPs for the Site (including MHLLC and GP) conducted a Site-wide RI/FS pursuant to an administrative agreement with the State of Michigan. During the 1993 and 1994 RI field work, approximately 125 submerged sediment samples were collected from within the channel of the former Plainwell Impoundment. Total PCB concentrations ranged from non-detect to 139 milligrams per kilogram (mg/kg).

The RI field work also included an assessment of the physical characteristics of the riverbanks within the three former impoundments. The PRPs concluded, primarily through visual observation, that the riverbanks were a source of ongoing loading of exposed sediments (and therefore PCB) to the river. The PRPs also identified, again primarily through visual observation, some of the mechanisms involved in such loading. The cohesive nature of the exposed sediments allows significant portions of the impoundments' riverbanks to remain in vertical-to-near-vertical repose. The fine-grained exposed sediments, however, generally overlie non-cohesive sandy sediments or soils. As a result, the faces of the banks are susceptible to erosion through direct contact with the river at higher river stages, and to undercutting by erosion of the underlying non-cohesive sediments or soils. Undercutting progresses until the overlying sediments fail by slumping or calving as blocks that fall into the river. The remnants of such blocks can be observed along the toe of the banks in certain areas. (BBL 2000).

The PRPs also conducted visual observations of the floodplain soils in the impoundment areas. The floodplain soils were often covered by a few inches of brown, silty-to-sandy soil, often mixed with organic material. The thickness of the floodplain soils at the Plainwell Impoundment ranged from several inches in the areas at the upstream end to several feet in areas near the dam sill, with an average thickness of 3.8 feet. Areas of gray clay deposition were observed in locations where the former impoundment water was relatively shallow or where backwater conditions existed.

The PRPs estimated the volume of the floodplain soils within the Plainwell Impoundment to be approximately 360,000 cy (BBL 2000). The PRPs collected 135 floodplain soil samples that had total PCB concentrations ranging from not-detected to 85 mg/kg, with an overall average concentration of 8.9 mg/kg (BBL, 1994a; BBL, 2000a). PCB concentrations were generally found to decrease with depth, and concentrations in subsurface soils tended to decrease with distance from the river.

2. USGS Study.

In 2002, the United States Geological Survey (USGS) and MDEQ prepared a study to define the Kalamazoo River's fluvial sedimentology within the Plainwell, Otsego, and Trowbridge impoundments. The objective of the study was to provide a better estimate of the volume, configuration, character, and distribution of in-stream sediments at the impoundments. The project included creating sediment-depth profiles and performing particle-size analyses from

sediment cores. The sediment cores provided information on both pre- and post-impoundment erosion and deposition. USGS concluded that lacustrine deposits accumulated when the dams were in place. The fine-grained deposits ranged in thickness from zero to 12 feet. Once the dam superstructures were removed, alluvial deposits accumulated on the erosional cut into the lacustrine deposits. These coarser deposits ranged in thickness from zero to 5.5 feet.

USGS used the data it collected to prepare a series of detailed isopach maps for each impoundment area. The maps depict not only sediment thicknesses as they currently exist, but also sediment thicknesses that would result from any dismantling of the dams. USGS estimated that complete removal of the three dams would increase the slope of the Kalamazoo River to more than 2 percent, making the river a moderate-gradient system (USGS 2002).

In 2005, USGS, in cooperation with U.S. EPA and MDEQ, conducted an additional study of the channel characteristics of the Kalamazoo River. This study concluded that the erosion of the “toe” of the bank widens the River’s stream, and results in steeper bank angles. Once the bank undercut exceeds its critical bank angle, the inability of the sediments to support themselves results in bank failure.

3. U.S. EPA Supplemental Response Activities.

In order to better determine the areal extent and volume of PCB-contaminated soils and sediments in the Plainwell and Otsego City impoundments, in 2001 U.S. EPA conducted a two-phase sampling program. During Phase I, U.S. EPA obtained in-stream sediment and floodplain soil samples from areas of the river system between Plainwell and Otsego. Phase II involved collecting samples in a radial grid pattern around specific samples collected during Phase I. (The purpose of such radial sampling is to provide U.S. EPA with greater resolution in determining the areal extent of contamination.)

During Phase I sampling of submerged sediments, U.S. EPA collected 53 samples whose total PCB concentrations ranged from not-detected to 33 mg/kg (Weston, 2002). During Phase II sampling, U.S. EPA collected an additional 160 sediment samples from around sample location SD004, which is approximately 1,500 feet upstream of the Plainwell Dam. The results of this effort showed total PCB concentrations ranging from not-detected to 4.2 mg/kg (Weston, 2002).

U.S. EPA collected 147 floodplain soil samples (Phase I), which ranged in total PCB concentration from not-detected to 84 mg/kg (Weston, 2002). The Agency followed up with Phase II radial sampling in three locations, referred to as Grid 1 (218 samples around Sampling Location [SL] 015), Grid 2 (235 samples around SL029), and Grid 6 (159 samples around SL012). Total PCB concentrations in the Phase II samples ranged from not-detected to 158 mg/kg in Grid 1; from not-detected to 45.3 mg/kg in Grid 2; and from not-detected to 65.6 mg/kg in Grid 6 (Weston, 2002).

U.S. EPA’s 2001 study confirmed: (1) that the gray clay material in the Plainwell Impoundment is indicative of waste paper residuals; (2) that most of the PCB contamination at these impoundments occurs within the uppermost two feet of sediment or soil; and (3) that “hot spots” of higher PCB concentration are located in the floodplain soils (Weston 2002).

4. PRP-conducted Supplemental Response Work.

a. Bank erosion studies

Since submitting the draft RI/FS Report in 2002, MHLLC and GP have conducted several supplemental studies regarding the nature and extent of PCB loading from the Plainwell Impoundment into the Kalamazoo River. Between 2000 and 2003, MHLLC and GP performed an analysis of the extent and rate of bank erosion by placing erosion pins in the riverbanks. Cross-sectional data from this work was documented in three erosion pin monitoring reports (BBL, June 2001; BBL, March 2002; BBL, January 2003). The PRPs generated evidence of erosion by comparing 1993 transects and a 2003 survey of 74 bank profiles (placed at 100-foot intervals), each of which was used to demarcate bank slope, top of bank, toe of bank, and bank cross-sections (BBL, 2003).

b. Bank characterization study

In 2003 the PRPs performed a bank characterization study which included 87 top-of-bank soil samples (BBL, 2003). Sample results indicated total PCB concentrations in these soils ranging from 0.20 mg/kg to 120 mg/kg. The calculated arithmetic average for PCBs in bank soils, derived from the combined 1993/94 RI field work and 2003 sampling, was 23 mg/kg. These combined data also indicated that PCB concentrations were greater in soils near the river channel, and concentrations decreased with distance from the river (BBL, 2000a; BBL, 2003).

c. In-stream sediment sampling

At the request of U.S. EPA, in 2006 the PRPs collected 222 in-stream sediment samples. Total PCB concentration in these samples ranged from not-detected to 220 mg/kg.

D. Risk Assessments

1. Human Health Risk Assessments.

The Michigan Department of Natural Resources first issued a public health advisory regarding PCB contamination in the Kalamazoo River in 1977. This advisory remains in place today, and warns against eating a variety of fish species from the river.

In December 1991, working under a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR), the Michigan Department of Public Health (MDPH) prepared a Public Health Assessment (PHA) for the Kalamazoo River Site. The PHA indicated that the Site was a public health hazard because of the probable exposure to hazardous substances at concentrations that might result in adverse health effects. Potential human exposure pathways of concern included incidental ingestion and inhalation of contaminated soils and ingestion of contaminated biota.

In April 2003, MDNR completed work on the human health risk assessment for the Site. Although the human health risk assessment's data and analysis pertain to the entire Kalamazoo River Operable Unit and not solely to the Plainwell Impoundment, the risk analysis is relevant to

Region 5's determination of imminent and substantial endangerment in this Action Memorandum. The primary human health risks identified in the assessment are summarized here:

- Cancer risks and noncarcinogenic Hazard Quotients (HQ) exceed U.S. EPA and/or MDEQ acceptable risk limits for both sport and subsistence fishermen. Carcinogenic risk from the consumption of fish ranges from 9.0×10^{-5} to 1.7×10^{-3} depending on the river segment being evaluated. Noncarcinogenic HQs for the consumption of fish range from 1.7 to 80 for reproductive effects and 5.3 to 280 for immunological effects.
- Cancer risks from dermal contact exceed MDEQ's thresholds for residents living near the floodplain soil behind the Plainwell Impoundment based on both average and maximum PCB exposure concentrations.
- Cancer risks from dermal contact exceed U.S. EPA's acceptable cancer risk range for residents living near the floodplain soils behind the Plainwell Impoundment based on maximum PCB exposure concentrations.
- HQs exceed the MDEQ and U.S. EPA threshold of 1.0 for immunological effects for residents living near the floodplain soils behind the Plainwell Impoundment based on average and maximum PCB exposure concentrations. The HQ for reproductive effects exceeds the MDEQ and USEPA threshold of 1.0 based on maximum PCB exposure concentrations .
- Cancer risks for recreational users on the floodplain soil behind the Plainwell Impoundment exceed MDEQ's threshold based on maximum PCB exposure concentrations.
- HQs for recreational users on the floodplain soil behind the Plainwell Impoundment exceed the U.S. EPA and MDEQ threshold of 1 for reproductive effects based on maximum PCB exposure concentrations.

2. Ecological Risk Assessment

MDEQ finalized the Ecological Risk Assessment (ERA) for the Kalamazoo River in April 2003. Like the Human Health Risk Assessment, the ERA's data and analysis pertain to the entire Kalamazoo River Operable Unit. Nevertheless, the ERA's findings are also relevant to Region 5's determination of imminent and substantial endangerment at the Plainwell Impoundment. Accordingly, the primary findings from the ERA are explained here.

The ERA focused primarily on assessing population-level risks associated with PCB contamination in abiotic media and biota. Because of the potential for PCBs to accumulate in biological tissues and exert adverse effects in upper trophic level biota, the ERA specifically considered bioaccumulation, food chain effects, and adverse effects in upper trophic level organisms.

The ERA focused on assessing the risks from PCB exposures via direct contact with contaminated surface water, streambed sediment, floodplain (exposed) sediment, and surface soil, as well as ingestion of PCB-contaminated food items.

The ERA concluded that PCB contamination at the Site presents a high to moderate ecological risk for eight animal species. Table 5.3 of the study identifies the estimated risks for all representative species of concern, based on estimated PCB dose (birds and mammals) or on the Site-wide average PCB concentration (aquatic receptors).

More particularly, the ERA found that PCB contamination of surface water and streambed sediment (and floodplain soils that are frequently inundated or have the potential to erode into the river) is likely to adversely affect sensitive piscivorous predators such as mink through consumption of PCB-contaminated prey, especially fish. Other piscivorous predators, such as bald eagles, also appear to be at high risk based on the exposure assumptions presented in the ERA. Terrestrial and semi-aquatic biota may also be at risk from PCB-contaminated floodplain sediment and surface soil, depending on life history (e.g. foraging behavior, diet, mobility) and sensitivity to PCBs. Omnivorous birds (represented by the robin) that consume substantial numbers of soil invertebrates, such as earthworms, appear to be at moderate but still significant risk.

Finally, the United States Fish and Wildlife Service has identified two federally endangered species, two federally threatened species, and one federal candidate species that can be present in Allegan County. The Karner blue butterfly and the Indiana bat both are endangered. The bald eagle and Pitcher's thistle (a plant) are both threatened in this region. The eastern massasauga rattlesnake is the lone candidate species (BBL 2000b).

The MDNR lists seven species as endangered or threatened (not including the federally-listed species) in or near the Site. Endangered species in this area include the zigzag bladderwort, wild American ginseng, and the log fern (plants), the creek chubsucker (fish), prairie warbler (bird), ottoe skipper (insect), and the spotted turtle (reptile) (BBL 2000b).

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Conditions present at the Plainwell Impoundment of the Kalamazoo River Site constitute a threat to public health, welfare or the environment based upon the factors set forth in 40 C.F.R. § 300.415(b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). These include, but may not be limited to, the following:

- Actual or potential exposure to nearby populations, animals, or the food chain from hazardous substances or pollutants or contaminants.

PCB is a hazardous substance, as that term is defined by Section 101(14) of CERCLA. PCBs are also listed as a hazardous substance under Section 311(b)(2) of the Clean Water Act, as set forth in 40 C.F.R. § 116.4 Table A. The Toxic Substances Control Act (TSCA) states that "exposure of human beings or the environment to PCBs... may be significant, depending upon the quantity of PCBs,...the likelihood of exposure to humans and the environment...." U.S. EPA has determined that PCBs are a probable human carcinogen. These chemicals have the potential to biomagnify, which means that they have the potential to increase in concentration as they are transferred from one link in the food chain to another.

The Plainwell Impoundment has PCB levels up to 220 mg/kg for in-stream sediments, 120 mg/kg in top-of-bank soils and 158 mg/kg in floodplain soils. The ongoing, uncontrolled erosion of soils from the riverbanks is a significant source of PCB loading to the Kalamazoo River. PCB-containing waste paper residuals and soils slough off the banks, to be deposited in the river or transported downstream (BBL, 2000a). In-stream sediments and bank soils are primary sources of an ongoing release of PCB into the waters of the Kalamazoo River.

Although the 1977 MDPH advisory is still in effect, the fish consumption advisory is simply that – advisory. MDPH personnel have observed that the Kalamazoo River between Kalamazoo and Plainwell is becoming a popular fishery. It has been reported that anglers have been taking home fish in amounts that may be inconsistent with the consumption advisories issued by the MDPH. It was also reported that turtles have also been taken from the river for human consumption, which would provide for another potential human exposure pathway.

The most significant outcome of the ecological and human health risk assessments is the conclusion that fish consumption is the primary exposure pathway for receptors that may be at risk from PCB within media of the Kalamazoo River. Therefore, the key to reducing exposure and potential risks to important receptors (e.g. fish-eating birds, fish-eating wildlife, and humans) is to reduce PCB concentrations in the fish tissue consumed by these receptors. The greatest factor controlling PCB levels in fish is the bioavailability of PCB in surface sediments and the water column where fish and their prey come in contact with or ingest PCB (BBL 2000).

Finally, MDEQ has identified an area of the Plainwell Impoundment where residential properties are located immediately adjacent to riverbank contamination in excess of 50 mg/kg PCB. Due to the direct contact risk, the proposed removal action will include excavation of these areas to the Michigan residential standard for PCB.

- High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;

On an annual basis, the Plainwell Impoundment contributes approximately 28 kg of PCB to the Kalamazoo River (BBL 2000). An estimated 2,317 kg (5,097 lbs) of PCB have come to be located within the sediments and soils of the Plainwell Impoundment. As explained above, the sediments and floodplain soils that are located in-stream or near the river's edge are susceptible to erosion and scouring. During high water events, inundation of the floodplain soils and

increases in river velocity create conditions that are likely to cause additional releases of PCB to the Kalamazoo River and, ultimately, Lake Michigan.

- Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;

The Kalamazoo River is often subjected to extreme weather conditions in the winter and spring, which enhance the threat of a release of PCB. The breakup of ice in the late winter, and the movement of ice floes downstream, cause scouring of the banks and river bottom. Likewise, heavy spring rains and/or summer storms increase stream volume and current velocity, which lead to increased scouring of the river bottom and banks. All of these forces cause an increase in the volume and extent of PCB contamination in the Kalamazoo River and Lake Michigan.

- The availability of other appropriate federal or state response mechanisms to respond to the release;

State and local response mechanisms are not available to respond to this release. Therefore, the Region 5 removal program will implement response actions to address an estimated 132,000 cubic yards of PCB-contaminated material containing approximately 2,000 kg (4,400 lbs) of PCB within the Plainwell Impoundment. Responding to this material prior to future high flow periods will provide added protection to the Kalamazoo River and downstream ecosystems.

IV. ENDANGERMENT DETERMINATION

Given the conditions at the Plainwell Impoundment, the nature of the hazardous substance there, and the potential exposure pathways described above, the actual or threatened release of PCB from the Plainwell Impoundment, if not addressed by implementing the response actions selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED ACTIONS

A. Description of the Proposed Action

The preferred response action to mitigate threats associated with PCB-contaminated sediments in the Plainwell Impoundment consists of removing contaminated submerged sediments and floodplain soils. The AOC will specify all required response actions, which will include, but may not be limited to, the following tasks:

- 1) dredging and/or excavation of PCB contaminated sediments behind the Plainwell Dam; in the 3 discrete sediment areas identified mid-channel; and within 40 feet from the existing bank;

- 2) cut-back and stabilization of riverbanks to mitigate exposures to PCB-contaminated banks and future erosion;
- 3) removal of PCB-contaminated floodplain soils in excess of 50 mg/kg PCB;
- 4) removal of the floodplain areas where residential exposure to PCB-contaminated floodplain soils is in excess of 4 mg/kg PCB, the Michigan residential standard for PCB in soil;
- 5) dewatering, as necessary, and disposal of all PCB-contaminated sediment and bank and floodplain soils removed pursuant to ¶¶ 1-4 above into existing landfills located at the Allied Paper Operable Unit of the Site;
- 6) the use of clean soils excavated as part of the bank cutback work to cover floodplain soils contaminated above human health or ecological risk levels;
- 7) an evaluation of the impact of removing PCB-contaminated sediments abutting the Plainwell Dam on the dam's structural integrity;
- 8) an evaluation of whether a temporary or permanent lowering of the water level within the river may minimize movement of PCB-contaminated sediments during construction and/or the erosion of banks and floodplains covered with clean soils; and
- 9) if appropriate in light of the evaluations in 7) and 8), removal of one or more portions of the Plainwell Dam structure as needed to reduce the risk of sudden failure of the Plainwell Dam and/or minimize short- and long-term PCB mobilization from banks and floodplains.
- 10) Finally, the response action shall ensure that a stable river channel exists post-removal, re-vegetation with native plant species occurs, and that appropriate monitoring is performed both during and after the response action.

The response action will be conducted in a manner not inconsistent with the NCP. The OSC has initiated planning for provision of post-removal site control consistent with the provisions of Section 300.415(l) of the NCP.

The response actions described in this memorandum directly address actual or threatened releases of hazardous substances, pollutants, or contaminants at the Plainwell Impoundment which may pose an imminent and substantial endangerment to public health, welfare and the environment. These response actions do not impose a burden on the affected property disproportionate to the extent to which that property contributes to the conditions being addressed.

These activities will require an estimated 400 on-site working days to complete.

B. Cleanup Standards

As noted above, subsequent to the completion of the proposed time-critical removal action, Region 5 will evaluate any residual risk to human health and the environment in an RI/FS for the first reach of the Kalamazoo River, which includes the Plainwell Impoundment. Remedial cleanup standards will be established in the FS and in the ROD for the entire first reach. For purposes of the proposed time-critical removal action, Region 5 has established the following cleanup standards:

- **Mid-channel in-stream sediments:** U.S. EPA has identified three mid-channel areas where PCB has been detected at concentrations in excess of 50 mg/kg. These sediments will be removed to either a ≤ 1 mg/kg PCB standard, or to a “neat line” representing an elevation of 6 inches above pre-impoundment channel bottom.
- **In-stream sediments located within 40 feet of the riverbanks:** These sediments will be removed to either a ≤ 1 mg/kg PCB standard, or to a “neat line” representing an elevation of 6 inches above pre-impoundment channel bottom.
- **PCB-contaminated soil in excess of 4 mg/kg on the river’s north floodplain on or near residential properties upstream of U.S. 131:** These soils will be removed to the extent the floodplain can be reasonably accessed.
- **PCB-contaminated soils elsewhere within the Plainwell Impoundment:** Floodplain soils with PCB concentrations in excess of 50 mg/kg at any depth, based on current data, will be removed. The cleanup goal for these soils is 5 mg/kg.

The Design will specify other project requirements to be completed as part of this removal action.

C. Orderly Transition to Remedial Response

The NCP requires that, if U.S. EPA determines that a removal action will not fully address a release, and that subsequent remedial action may be necessary, then the Agency must ensure an orderly transition from removal to remedial response activities. 40 C.F.R. § 300.415(g). As noted above, subsequent to the removal action selected in this Action Memorandum, Region 5 will complete its evaluation, through the Superfund remedial process, of the risks to human health and the environment within the entire first reach of the Kalamazoo River (which includes the Plainwell Impoundment). Residual risks to human health and the environment remaining within the impoundment after completion of the removal action will be evaluated as part of that

process. If U.S. EPA determines that additional response work is necessary in the Plainwell Impoundment, such work will be required by the ROD.

D. Applicable or Relevant And Appropriate Requirements

All applicable or relevant and appropriate requirements (ARARs) of federal and state law will be complied with to the extent practicable. By letter dated October 23, 2006, Region 5 requested that MDEQ identify potential state ARARs for this response action. Any state ARARs identified in a timely manner for this removal action will be complied with to the extent practicable.

E. Compliance with the PCB Remediation Waste Rule

Most, if not all, of the wastes to be excavated and/or dredged from the Plainwell Impoundment will be at least temporarily disposed in the landfills located at the Allied Paper Operable Unit (OU #1) of the Site. MDEQ is currently in the process of completing the RI for OU #1. The RI Report will identify all potential federal and state ARARs for the OU #1 remedial action.

Region 5 has determined that, with regard to the disposal of wastes from the Plainwell Impoundment with PCB concentrations exceeding 50 mg/kg, the relevant portions of the PCB Remediation Waste Rule, 40 C.F.R. § 761.61 *et seq.*, collectively comprise an ARAR for the proposed removal action. Region 5 also anticipates that the PCB Remediation Waste Rule will be an ARAR for the OU#1 remedy. In the course of determining the remedy for OU #1, the Region 5 TSCA and Superfund programs will evaluate the appropriateness of permanent consolidation and disposal of the sediments and soils from the Plainwell Impoundment in the Allied Paper OU landfills. Accordingly, for purposes of this removal action, compliance with the TSCA ARAR will occur as part of Region 5's selection of the remedy for OU #1.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Continued risk to public health and the environment will result if response action is delayed or not taken. Delayed action increases the likelihood that human and/or wildlife populations with access to the area will come into direct contact with PCB-contaminated sediments and floodplain soils.

VII. OUTSTANDING POLICY ISSUES

No outstanding policy issues have been identified in relation to the Plainwell Impoundment.

VIII. ENFORCEMENT

For administrative purposes, information concerning the enforcement strategy associated with this removal action is contained in a confidential Enforcement Addendum.

IX. RECOMMENDATION

This decision document represents the selected response action for the Plainwell Impoundment area of the Kalamazoo River Site. It was developed in accordance with CERCLA as amended, and is not inconsistent with the NCP. This decision is based upon the Administrative Record (Attachment 2) for the removal action, an index of which is attached to this Action Memorandum.

Conditions at the Plainwell Impoundment meet the criteria of Section 300.415(b)(2) of the NCP for a removal action, and I recommend your approval of the proposed removal action. Region 5 expects that two potentially responsible parties will perform all removal actions under the oversight of the OSC. You may indicate your decision by signing below.

APPROVE: Richard C. Karl DATE: 2-14-07
Richard C. Karl,
Director, Superfund Division

DISAPPROVE: _____ DATE: _____
Richard C. Karl,
Director, Superfund Division

Attachments:

Enforcement Addendum
Environmental Justice Analysis
Attachment 1: Agreement in Principle
Attachment 2: Administrative Record Index .
Attachment 3: Description of Previous Site Assessments

cc: D. Chung, U.S. EPA, 5203-G
M. Chezick, U.S. DOI, w/o Enf. Addendum
Steven E. Chester, Director, Michigan DEQ, w/o Enf. Addendum
Michael Cox, Michigan Attorney General, w/o Enf. Addendum

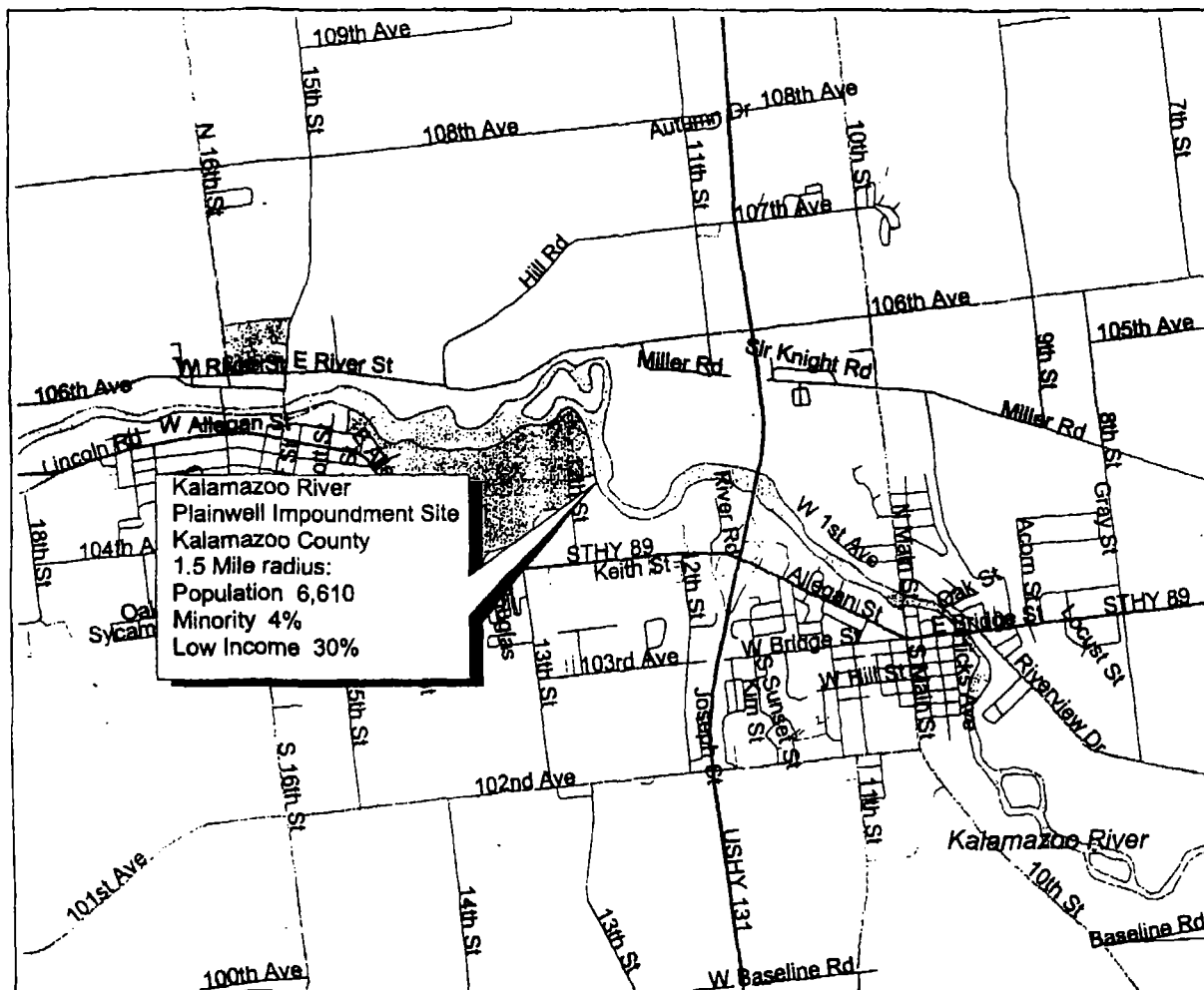
ENFORCEMENT ADDENDUM

HAS BEEN REDACTED

NOT RELEVANT TO THE SELECTION OF THE REMOVAL ACTION

Region 5 Superfund EJ Analysis

Kalamazoo River Plainwell Impoundment Site

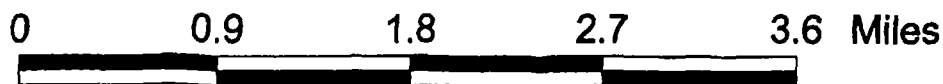


State of Michigan averages:
Minority: 21%
Low Income: 29%

**U.S. EPA Region 5
Environmental Justice Case Criteria
for State of Michigan**

Minority: 42% or greater

Low Income: 58% or greater



Date of Map: 10/16/08

Sources of Map: Census 2000 Database
ArcView 3.0

ATTACHMENT 1
AGREEMENT IN PRINCIPLE

HAS BEEN REDACTED

PRIVILEGED AND CONFIDENTIAL:
SUBJECT TO FRE 408 AND MEDIATION PRIVILEGE

ATTACHMENT 2

U.S. ENVIRONMENTAL PROTECTION AGENCY REMOVAL ACTION

ADMINISTRATIVE RECORD FOR ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE OPERABLE UNIT #5 PLAINWELL IMPOUNDMENT KALAMAZOO, KALAMAZOO COUNTY, MICHIGAN

ORIGINAL
FEBRUARY 12, 2007

<u>NO.</u>	<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
1	12/23/91	ATSDR	U.S. EPA	Preliminary Health Assessment for the Allied Corp. Kalamazoo Plant	41
2	10/00/00	Blasland, Bouck & Lee, Inc.	U.S. EPA	Feasibility Study Report - Phase I for the Allied Paper/Portage Creek/Kalamazoo River Site (DRAFT FOR STATE AND FEDERAL REVIEW)	407
3	10/00/00	Blasland, Bouck & Lee, Inc.	U.S. EPA	Remedial Investigation Report - Phase I for the Allied Paper/Portage Creek/Kalamazoo River Site (DRAFT FOR STATE AND FEDERAL REVIEW)	653
4	02/01/02	Roy F. Weston, Inc.	U.S. EPA	Removal Assessment Report for the Allied Paper-Kalamazoo River Site	742
5	04/00/03	Camp, Dresser & McKee	U.S. EPA	Baseline Ecological Risk Assessment for the Allied Paper/Portage Creek/Kalamazoo River Site (FINAL REVISED)	140
6	04/00/03	CH2M Hill	U.S. EPA	Remedial Investigation Report for the Allied Paper/Portage Creek/Kalamazoo River Site (U.S. EPA INTERNAL DRAFT)	102
7	05/00/03	Camp, Dresser & McKee	U.S. EPA	Human Health Risk Assessment for the Allied Paper/Portage Creek/Kalamazoo River Site (FINAL REVISED)	109

Allied Paper/Portage Creek/Kalamazoo River AR
 Operable Unit #5
 Plainwell Impoundment
 Original
 Page 2

<u>NO.</u>	<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
8	07/25/06	ATSDR	File	Health Consultation: ATSDR Response to Public Advisory Council for Kalamazoo River Area of Concern RAP Comments on the Public Health Assessment for the Allied Paper/Portage Creek/Kalamazoo River Site	18
9	08/28/06	Mediation Parties	File	Plainwell Settlement Agreement in Principle (PRIVILEGED AND CONFIDENTIAL: SUBJECT TO FRE 408 AND MEDIATION PRIVILEGE)	8
10	10/02/06	Blasland, Bouck & Lee, Inc.	File	Design Report (Section 1) for the Plainwell Impoundment (DRAFT MEDIATION CONFIDENTIAL)	4
11	00/00/00	Borries, S., U.S. EPA	Karl, R., U.S. EPA	Enforcement Action Memo- randum: Determination of Need to Conduct a Time-Critical Removal Action at the Allied Paper/Portage Creek/ Kalamazoo River Plain- well Impoundment (PENDING)	

Attachment 3 – Description of Site Assessments

The nature and extent of PCBs within the Plainwell Impoundment were investigated as part of the RI/FS field work conducted by certain PRPs across the Superfund Site in 1993 and 1994. Results of that effort were reported primarily in Technical Memorandum 12 – Former Impoundment Sediment and Geochronologic Dating Investigation (Blasland, Bouck & Lee, Inc. [BBL], 1994a), with some additional floodplain data presented in Technical Memorandum 2 – Results of Phase I TBSA Soil Sampling (BBL, 1994a). Prior to the RI/FS, MDNR had collected analytical and characterization data, which were reported in the Interim Remedial Action for Portions of the Kalamazoo River System – Conceptual Design Technical Memorandum (GZA Donohue, 1990). In 2000, all available analytical and physical characterization data collected to date were summarized and assessed in the Draft Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site Remedial Investigation/Feasibility Study (RI/FS Report; BBL, 2000a). (The PRPs' assessment was ultimately disapproved by MDEQ.) Additional data were presented in the Supplement to the Kalamazoo River RI/FS –Phase I (Supplement Report; BBL 2000b), as well as the subsequent 2001 update to the RI report entitled PCB in the Kalamazoo River – Update for Decision Makers (BBL, 2001). In 2001, EPA conducted additional focused sampling of sediments and soils in the Plainwell Impoundment, and the results were presented in the Removal Assessment Report for Allied Paper Kalamazoo River Site, Otsego/Plainwell, Michigan (Weston, 2002). A survey of riverbank profiles was performed in 2003; the results of the survey and riverbank soil PCB data were reported in the Former Plainwell Impoundment Bank Characterization Technical Memorandum (BBL, 2003). The most recent PCB data were generated from pre-design sediment sampling conducted by BBL in 2006. A variety of pre-design studies have also been conducted in 2005 and 2006 to further characterize the Plainwell Impoundment, e.g. site topography, bank stability/disposition, flow hydrodynamics, equipment accessibility, and habitat quality. These pre-design studies will be summarized within the time critical removal action Design Report and its attachments.